## REMARKS

Upon entry of this amendment, claims 55-64 are all the claims pending in the application. Non-elected claims 35-54 have been canceled by this amendment.

Applicant notes that a number of editorial amendments have been made to the specification and abstract for grammatical and general readability purposes. Due to the number of changes made, a substitute specification and abstract are submitted herewith. No new matter has been added. Also enclosed is a marked-up copy of the original specification and abstract showing the changes incorporated into the substitute specification and abstract.

### I. Claim Rejections under 35 U.S.C. § 102

Claims 55-64 were rejected under 35 U.S.C. § 102(b) as being anticipated by Watson (U.S. 5,765,923).

Claim 55, as amended, recites the features of a first pressure wave deforming means which comprises a junction between a side wall of a cartridge and a base of the cartridge; and a second pressure wave deforming means which comprises at least one member disposed inside the cartridge or outside the cartridge, or at least one member disposed inside a propellant positioned at a distance away from the base of the cartridge. Applicant respectfully submits that Watson does not disclose or suggest such a combination of features.

Regarding Watson, Applicant notes that in a first embodiment disclosed therein (see Figs. 1 and 2), a cartridge for gas injector 1 is provided having a cartridge base 2 and a cartridge body 5, wherein an igniter tube 7 is inserted therein (see Figs. 1 and 2; and col. 7, lines 48-57). As explained in Watson, Fig. 2 shows a schematic view of the cartridge for gas injector 1 of Fig. 1

loaded in a combustion chamber 17, which is in turn shown in a position for firing in a drill hole bottom 19 in the rock 20 (see col. 8, lines 32-36).

In Watson, it is disclosed that as soon as the pressure inside the cartridge builds up, the front end of the cartridge ruptures and the propellant gases are released into the combustion chamber 17 and a gas injection barrel 21 (see Fig. 2 and col. 8, lines 59-65). The pressure in the drill hole bottom 19 rapidly builds up as gas moves down the barrel, thereby causing the rock 20 to fracture (see col. 9, lines 13-15).

In contrast to the first embodiment of Watson, in which the cartridge is not placed directly in the rock hole, in a second embodiment disclosed in Watson, a cartridge body 25 is inserted directly in the bottom of a drill hole 40 of the rock (see Figs. 3 and 4; and col. 9, lines 16-19). Thus, in the second embodiment, the gas injector barrel 21 is not utilized.

As explained in Watson, when the propellant is fired in the second embodiment, once the pressure in the cartridge is sufficient to rupture the cartridge body 25, the cartridge walls expand against the wall of the drill hole, and rupture grooves 32 formed in the cartridge front end facilitate the rupturing of the cartridge at the front end thereof (see col. 10, lines 21-27).

Thus, in Watson, a first embodiment is described in which propellant gases released from the ruptured cartridge travel down a gas injection barrel 21 so as to break the rock at the bottom of the rock hole, and a second embodiment is disclosed in which a cartridge is directly inserted into the rock hole such that the propellant gases released from the ruptured cartridge are directly channeled to the adjacent rock so as to break the rock at the bottom of the rock hole. Thus, in

both embodiments of Watson, the rock hole is pressurized by a single means at a single location; namely, at the bottom of the rock hole.

As noted above, claim 1 has been amended to recite the features of a first pressure wave deforming means and a second pressure wave deforming means, in which the first pressure wave deforming means comprises a junction between the side wall and the base of the cartridge, and the second pressure wave deforming means comprises at least one member disposed inside the first cartridge or outside the first cartridge, or at least one member disposed inside the propellant.

Thus, according to the present invention, there are two means for pressurizing the rock hole in order to break the rock. That is, a first means which comprises the junction between the side wall and the base of the cartridge, and a second means which comprises at least one member disposed inside the first cartridge or outside the first cartridge, or at least one member disposed inside the propellant.

Based on the foregoing description of Watson, Applicant respectfully submits that while Watson discloses the ability to break rock by releasing propellant gas from either a cartridge that is used in conjunction with a gas injection barrel (i.e., the first embodiment), or a cartridge that is placed directly into a rock hole (i.e., the second embodiment), that Watson does not disclose the ability to break rock by utilizing two pressure wave deforming means, wherein the first pressure wave deforming means comprises a junction between the side wall and the base of the cartridge, and the second pressure wave deforming means comprises at least one member disposed inside the first cartridge or outside the first cartridge, or at least one member disposed inside the propellant, as recited in amended claim 55.

An advantage of the present invention over Watson, for example, is that by providing two distinct means for pressurizing the rock hole, as described above, it is possible to fracture the rock hole at more than one spaced apart point along the length of the rock hole, thereby preventing premature termination of crack propagation over the length of the rock hole that can be caused by open joints traversing the rock hole which dissipate the propellant gases that are released from the cartridge.

In view of the foregoing, Applicant respectfully submits that Watson does not disclose, suggest or otherwise render obvious all of the features recited in amended claim 55. Accordingly, Applicant submits that claim 55 is patentable over Watson, an indication of which is kindly requested. Claims 56-63 depend from claim 55 and are therefore considered patentable at least by virtue of their dependency.

Regarding claim 64, Applicant notes that this claim has been drafted as an independent claim, and recites the features of a first cartridge that includes a first initiator, a second cartridge that includes a second initiator, a first pressure wave deforming means, and a second pressure wave deforming means, wherein the first and second cartridges are positioned in an assembly with the first and second initiators at opposed remote points in the assembly.

As noted above, in Watson, a first embodiment is described in which propellant gases released from a ruptured cartridge travel down a gas injection barrel 21 so as to break the rock, and a second embodiment is disclosed in which a cartridge is directly inserted into the rock hole such that the propellant gases released from the ruptured cartridge are directly channeled to the adjacent rock.

In the Office Action, the Examiner takes the position that the cartridge body 25 of Watson corresponds to a first cartridge, and that the igniter tube 34 of Watson corresponds to a second cartridge (see office Action at page 4).

Applicant respectfully submits, however, that while Watson discloses a cartridge body 25 having an igniter tube 34 located therein, that the cartridge body 25 and the igniter tube 34 are not positioned in an assembly such that an initiator of the cartridge body 25 is disposed at an opposed point in the assembly from an initiator of the igniter tube 34.

Accordingly, Applicant respectfully submits that Watson does not disclose the features of a first cartridge having a first initiator, and a second cartridge having a second initiator, wherein the first and second cartridges are positioned in an assembly with the first and second initiators disposed at opposed remote points in the assembly, as recited in claim 64.

In addition, Applicant respectfully submits that Watson also does not disclose a first pressure wave deforming means which is exposed to a pressure wave generated by initiating the first propellant; and a second pressure wave deforming means which is exposed to a pressure wave generated by initiating the second propellant, as recited in amended claim 64.

In view of the foregoing, Applicant submits that Watson does not disclose, suggest or otherwise render obvious all of the features recited in claim 64. Accordingly, Applicant submits that claim 64 is patentable over Watson, an indication of which is kindly requested.

## II. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may best be resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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